

The Connecticut Agricultural Experiment Station.

NEW HAVEN, CONN.

BULLETIN No. 88.

JULY, 1886.

GRATUITOUS ANALYSIS OF COMMERCIAL FERTILIZERS.

To insure justice to manufacturers, dealers and consumers alike, the Station henceforth will make gratuitous analyses of Commercial Fertilizers only on samples taken by the Agents of the Station or on such others as are properly authenticated by the certificate of the person drawing the sample *and in addition* the witness, either

1. Of a Selectman ;
2. Of an Officer of a farmer's club, grange or local agricultural society ; or
3. Of the Dealer from whose stock the sample is taken.
4. In case a Dealer takes samples of his own stock, the witness of one of the Officers aforesaid will be required.

In special cases of importance the Station may send its Agent to draw samples.

INSTRUCTIONS FOR SAMPLING COMMERCIAL FERTILIZERS.

1. Provide a teacup, some large papers and for each sample a glass fruit can or tin box holding about one quart that can be tightly closed, all to be clean and dry.

2. Open at least three full and unbroken packages, or if there are more than thirty, every tenth package, and mix well together the contents of each for a foot in depth, take out two cupfuls from different parts of the mixed portions of each package, pour them [six in all] one over another, upon a paper, intermix

thoroughly but quickly to avoid gain or loss of moisture, fill the can or box from this mixture, close tightly, fix securely on the outside of the can a label with some distinguishing letter or mark (which is to be copied in the "Description of Sample" as *sampler's mark*), and send prepaid to the Agricultural Experiment Station, New Haven, Conn.

3. If convenient weigh separately at least three packages and enter these *actual weights* in the "Description of Sample."

4. When a sample has been taken it should *always* be bottled, labeled and the form for its description filled out completely *before* beginning to sample another fertilizer.

FURTHER REMARKS ON SAMPLING.

In case of a fine, uniform and moist or coherent article, a butter-tryer or a tin-tube, like a dipper handle, put well down into the packages in several places, will give a fair sample with great ease.

With dry, coarse articles, such as ground bone, there is liable to be a separation of coarse and fine parts on handling. Moist articles put up in bags or common barrels may become dry on the outside. It is in these cases absolutely necessary to mix thoroughly the coarse and fine, the dry and the moist portions before sampling.

The quantity sent should not be too small. When the material is fine and uniform, a pint is enough, but otherwise and especially in the case of ground bone, which must be mechanically analyzed, the sample should not be *less than one quart*.

It is important that samples for analysis should be taken at the time when the fertilizer is purchased, and *immediately dispatched* to the Station. Moist fish, blood or cotton seed meal will soon decompose and lose ammonia, if bottled and kept in a warm place. Superphosphates containing much organic nitrogen will suffer reversion of their soluble phosphoric acid under similar circumstances. Most of the moist fertilizers will lose water unless tightly bottled, but some of the grades of potash salts will gather moisture from the air and become a slumpy mass if not thoroughly protected.

Samples as to whose authenticity or fairly representative character there is any reasonable doubt, the Station will not analyze. The Station reserves the right to reject samples taken from less than half a ton of stock or those drawn from goods that have been wintered over from last year.

Send with each sample any printed circular, pamphlet, analysis or statement that accompanies the fertilizer or is used in its sale.

DESCRIPTION OF SAMPLE.

Station No. _____. Rec'd at Station, _____, 188.

Each sample of Commercial Fertilizer sent for gratuitous analysis *must be* accompanied by a Description made by filling out legibly and as fully as possible, the blanks that follow :

Sampler's Mark, _____

Brand of Fertilizer, _____

Name and address of Manufacturer, _____

Name and address of Dealer from whom this sample was taken,

Date of taking this sample, _____

Is it stated to be fresh stock? _____

Dealer's cash price per ton or hundred, bag or barrel, _____

Selling weight claimed for each package weighed, _____

Actual weight of the several packages opened, _____

Number of packages from which the sample was taken, _____

Insoluble Phosphoric Acid, _____

Here write the per cents of valuable ingredients which the fertilizer is guaranteed to contain.

Soluble Phosphoric Acid, _____ Nitrogen, _____

Reverted Phosphoric Acid, _____ (Ammonia, _____)

(Available Phosphoric Acid, _____) Potash, _____

Insoluble Phosphoric Acid, _____

CERTIFICATE OF PERSON TAKING THE SAMPLE.

I, the undersigned, certify that the accompanying sample marked.....was taken by me from full packages, and in accordance with the Station's Instructions for Sampling and to the best of my knowledge and belief fairly represents the stock from which it was drawn, and that said stock when sampled was properly housed and in good condition. I also certify that the foregoing description is correct.

Signature, _____

Post Office address, _____

WITNESS OF OFFICER OR DEALER.

The above described sample was drawn in my presence.

Signature, _____

Title, _____

Township, _____

Post Office Address, _____

OBSERVANCE OF THE FERTILIZER LAW.

Manufacturers who have paid Analysis Fees as required by the Fertilizer Law, and Fertilizers for which the Fees have been thus paid for the year ending May, 1887.

Firm.

Adams & Thomas, Springfield, Mass.
Apothecaries Hall Co., Waterbury, Conn.
Baker, H. J. & Co., 215 Pearl St., New York.

Brand of Fertilizer.

Adam's Market Bone Fertilizer.
Victor Phosphate.
A.A. Ammoniated Superphosphate.
Pelican Bone Fertilizer.
Potato Fertilizer.
Corn Fertilizer.
Tobacco Fertilizer.
Castor Pomace.

<i>Firm.</i>	<i>Brand of Fertilizer.</i>
Bennett, P. W., Middlefield, Conn.	Ground Bone.
Bosworth Bros., Putnam, Conn.	Superphosphate of Lime.
	Ground Bone.
Bowker Fertilizer Co., 43 Chatham St., Boston, Mass.	Stockbridge Grain Manure.
	“ Forage Crop Manure.
	“ Vegetable Manure.
	Bowker's Hill and Drill Phosphate.
	“ Dissolved Bone.
	“ Fish and Potash.
	“ Dry Fish.
Bradley Fertilizer Co., 27 Kilby Street, Boston, Mass.	Bradley's Superphosphate.
	B. D. Sea Fowl Guano.
	Original Coe's Superphosphate.
	Complete Manure for Corn and Grain.
	“ “ Potatoes and Root Crops.
	Complete Manure for Top Dressing Grass and Grain.
	Circle Brand Bone and Potash.
	Fish and Potash, Anchor Brand.
	“ “ Triangle A Brand.
Buffalo Fertilizer and Chemical Works, Buffalo, N. Y.	Crocker's Buffalo Ammoniated Superphosphate.
	Crocker's Buffalo Potato, Hop and Tobacco Phosphate.
	Crocker's Pure Fine Ground Bone.
Clark's Cove Guano Co., New Bedford, Mass.	Great Planet A Brand.
	“ B Brand.
	Bay State Fertilizer.
	Unicorn Ammoniated Superphosphate.
Coe, E. Frank, 16 Burling Slip, New York City.	Excelsior Guano.
	High Grade Ammoniated Bone Superphosphate.
	Alkaline Bone.
	Ground Bone.
Coe, Russell, Tremley, N. J.	Ammoniated Superphosphate.
Collier White Lead & Oil Co., St. Louis, Mo., by F. Ellsworth, Hartford.	Collier Castor Pomace.
Common Sense Fertilizer Co., Boston, Mass.	Common Sense Fertilizer No. 2.
	“ “ No. 3.
Cooper's, Peter, Glue Factory, 17 Burling Slip, N. Y.	Peter Cooper's Bone Dust.
Curtis, J. G., Elliot, Conn.	Ground Bone.
Darling, L. B., Fertilizer Co., Pawtucket, R. I.	Darling's Fine Bone.
	“ Animal Fertilizer.
Darling, L. B., Fertilizer Co., Pawtucket, R. I.	Eagle Brand Bone.
Dickenson, D. B., Middle Haddam, Conn.	Ammoniated Bone Superphosphate.
Harris & Son, Eagleville, Conn.	Bone.
	Superphosphate.
Hurtado & Co., 16 & 18 Exchange Place, New York.	Peruvian Guano Standard.
Kelsey, E. R., Branford, Conn.	Fish and Potash.
Lamb, J. A., 238 State Street, Hartford, Conn.	Church's Fish and Potash, Brand D.
Lister Agricultural Chemical Works, Newark, N. J.	Ground Bone.
	Standard Phosphate.
	Ammoniated Dissolved Bone.
	Potato Manure.

<i>Firm.</i>	<i>Brand of Fertilizer.</i>
Mapes' Formula and Peruvian Guano Co., 158 Front St., New York.	Mapes' Potato Manure. " Corn Manure. " Complete Manure [Light Soils.] " " " [General Use.] " Tobacco " [Conn. Brand.] " " " [for use with stems.]
	Mapes' Complete Manure [A Brand.] " Nitrogenized Superphosphate. " High Grade Superphosphate. " Fine Dissolved Bone. " Muriate of Potash. " Nitrate of Soda. " Sulphate of Ammonia. " Ground Bone. " Grass and Grain Spring Top Dressing.
Meyer, C., Jr., Maspeth, L. I.	Acme Fertilizer No. 1. " No. 2.
Miles, G. W., Agent, Milford, Conn.	I. X. L. Ammoniated Superphosphate. Fish and Potash, "Fish Brand."
Miller, G. W. Middlefield, Conn.	I. X. L. Phosphate. Pure Ground Bone.
Mitchell, A., Linden, N. J.	Mitchell's Phosphate.
National Fertilizer Co., Bridgeport, Ct.	Chittenden's Fish and Potash. " Ammoniated Bone Super- phosphate. " Superphosphate. " Complete Fertilizer. " Fine Animal Bone.
New Haven Fertilizer Co., New Haven, Conn.	Standard Superphosphate.
Newton & Ludlam, 182 Front St., New York.	Cereal Fertilizer. Cecrops or Dragon's Tooth Fertilizer. Animal Bone.
Peck Brothers, Northfield, Conn.	Pure Ground Bone.
Plumb & Winton, Bridgeport, Conn.	Bone Fertilizer. Ground Bone.
Preston Fertilizer Co., Green Point, L. I.	Preston's Ammoniated Bone Superphos- phate. " Ground Bone.
Quinnipiac Fertilizer Co., New London, Conn.	Quinnipiac Phosphate. " Extra Superphosphate.
Quinnipiac Fertilizer Co., New London, Conn.	Quinnipiac Potato Manure. " Bone Meal. " Fish and Potash Crossed Fishes Brand.
	Quinnipiac Fish and Potash Plain Brand. Dry Ground Fish. Muriate of Potash. Nitrate of Soda.
Read & Co., 88 Wall St., New York.	Cook's Blood Guano. " Dissolved Ground Bone.
Rogers & Hubbard Co., Middletown, Ct.	Ground Bone—Meal. " Bone, Grade A. " Bone, Grade A X.
	Muriate of Potash. Nitrate of Soda.
M. L. Shoemaker & Co., Philadelphia, by F. Ellsworth, Hartford, Conn.	Swift-Sure Bone Meal. " Superphosphate.

<i>Firm.</i>	<i>Brand of Fertilizer.</i>
Smith, Edmund, South Canterbury, Ct.	Ground Bone.
Soluble Pacific Guano Co., Glidden & Curtis, Agents, Boston, Mass.	Soluble Pacific Guano.
	Golden Leaf Fertilizer.
	Fish and Potash.
	Cotton Hull Ashes.
I. L. Spencer, Suffield, Conn.	Ammoniated Bone Superphosphate.
Stearns & Co., 181 Front St., New York.	Eagle Brand Fish and Potash.
	Ground Fish Guano.
	Bone Fertilizer.
Thompson, Gilbert, 249 Front St., N. Y.	Charter Oak Fertilizer.
Thomson, Paul, Hartford, Conn.	Wilkinson's Ammoniated Superphosphate.
Wilkinson & Co., 239 Center St., N. Y.	Americus Superphosphate.
	Bone Meal.
	Dissolved Bone Black.
	Dry Ground Fish.
	Dried Blood.
	Fish and Potash.
	Kainite.
	Muriate of Potash.
	Potato Phosphate.
	Tobacco Phosphate.
	Royal Bone Phosphate.

TRADE VALUES OF FERTILIZING INGREDIENTS IN RAW MATERIALS AND CHEMICALS FOR 1886.

Cents per lb.

Nitrogen in ammonia salts	18.5
“ in nitrates	18.5
Organic nitrogen in dried and fine ground fish	17
“ “ in guanos, dried and fine ground blood and meat	17
“ “ in cotton seed, linseed meal and in castor pomace	17
“ “ in fine ground bone	17
“ “ in fine medium bone	15
“ “ in medium bone	13
“ “ in coarse medium bone	11
“ “ in coarse bone, horn shavings, hair and fish scrap	9
Phosphoric acid, soluble in water	8
“ “ soluble in ammonium citrate*	7½
“ “ insoluble in dry ground fish	7
“ “ in fine bone	7
“ “ in fine medium bone	6
“ “ in medium bone	5
“ “ in coarse medium bone	4
“ “ in coarse bone	3
“ “ in fine ground rock phosphate	2
Potash as high grade sulphate	5½
“ kainit	4½
“ muriate	4½

TRADE VALUES IN SUPERPHOSPHATES, SPECIAL MANURES AND MIXED FERTILIZERS OF HIGH GRADES.

In form of nitrates and ammonia salts nitrogen is valued at $18\frac{1}{2}$ cents per pound. The Organic Nitrogen is reckoned at the highest figure laid down in the Trade-values of Fertilizing Ingredients in Raw Materials, namely, 17 cents per pound, it being assumed that the organic nitrogen is derived from the best sources, viz: bone, blood, animal matter, or other equally good forms and not from leather, shoddy, hair or any low-priced inferior forms of vegetable matter, unless the contrary is ascertained.

Soluble phosphoric acid is valued at 8 cents per pound and reverted at $7\frac{1}{2}$ cents. Insoluble Phosphoric acid is reckoned at 3 cents, it being assumed, unless found otherwise, that it is from bone or similar source and not from rock phosphate. In this latter form the insoluble phosphoric acid is worth but 2 cents per pound. Potash is rated at $4\frac{1}{2}$ cents, if sufficient chlorine is present in the fertilizer to combine with it to make muriate. If there is more Potash present than will combine with the chlorine, then this excess of Potash is reckoned as sulphate at $5\frac{1}{2}$ cents per pound.

In most cases the valuation of the Ingredients in Superphosphates and Specials falls below the retail price of these goods. The difference between the two figures, represents the manufacturer's charges for converting raw materials into manufactured articles. These charges are for grinding and mixing, bagging or barreling, storage and transportation, commission to agents and dealers, long credits, interest on investment, bad debts, and finally, profits.

In 1885 the average selling price of Ammoniated Superphosphates and Guanos was \$37.60, the average valuation was \$30.47, and the difference \$7.13—an advance of 23.4 per cent. on the valuation and on the wholesale cost of the fertilizing elements in the raw materials.

In case of Specials the average cost was \$44.80, the average valuation \$38.70, and the difference \$6.10 or less than 16.0 per cent. advance on the valuation.

To obtain the Valuation of a Fertilizer (i. e. the money-worth of its fertilizing ingredients), we multiply the pounds per ton of Nitrogen, etc., by the trade-value per pound. We thus get the values per ton of the several ingredients, and adding them together we obtain the total valuation per ton.

Further explanations may be found in the Annual Report.

FERTILIZER ANALYSES.

1680. Muriate of Potash, stock of R. B. Bradley & Co., New Haven, from H. J. Baker & Co., New York, sampled and sent by C. P. Auger, Whitneyville. A white and dry opaque material differing in appearance from ordinary muriate which is damp, yellowish and translucent.

ANALYSIS.	
*Potash,	52.43
Soda,	5.38
Lime,53
Magnesia,	1.77
Chlorine,	44.87
Sulphuric Acid,	3.38
Matters insoluble in water,65
Undetermined,	1.10
	<hr/>
	110.11
Deduct oxygen equivalent to Chlorine,	10.11
	<hr/>
	100.00

* Equivalent muriate of potash, 82.99.

The composition of the sample may otherwise be expressed as follows:—

Potassium chloride, (muriate of potash).....	83.0
Sodium chloride, (common salt).....	8.9
Sodium sulphate.....	1.6
Calcium sulphate.....	1.3
Magnesium sulphate.....	3.8
Water and a little carbonic acid.....	1.4
	<hr/>
	100.0

COTTON HULL ASHES.

1668. Fine ground Cotton Hull Ashes, Stock of R. E. Pinney, Suffield, sampled and sent by F. B. Hatheway, Windsor Locks. This sample represents stock which had been ground in a mill to make it fine and uniform.

1690. Cotton Hull Ashes from stock of W. W. Cooper, Suffield, received by him from Olds & Whipple, Hartford.

1649. Cotton Hull Ashes from stock of R. A. Parker, Warehouse Point, sampled and sent by J. B. Noble, East Windsor Hill.

1667. Cotton Hull Ashes, selected from bags which contained ashes of light straw color.

1669. Cotton Hull Ashes, selected from bags which contained ashes of dark color. The last two samples were got from stock of W. W. Cooper but do not represent goods which are offered for sale.

1632 and **1648** were samples drawn by different parties from the same stock of $1\frac{1}{2}$ tons of Cotton Hull Ashes.

ANALYSES.

	1668	1690	1649	1667	1669	1632	1648
Potash.....	24.46	22.76	23.97	27.81	22.08	12.78	14.55
Soluble Phosph. acid.....	1.70	.46	.93	5.68	10.77	.90	.74
Reverted Phosph. acid.....	9.78	7.39	8.19			5.16	5.46
Insoluble Phosph. acid.....	.94	2.08	.59			1.10	1.02
Cost per ton.....	\$35.00	35.00	35.00			35.00	35.00
Valuation per ton.....	\$44.86	38.12	40.39			23.67	25.77

These analyses represent the variations in quality which occur in Cotton Hull Ashes in the Connecticut market. Analyses **1667** and **1669** illustrate the fact that ashes of light color are richer in potash than dark colored ashes. The ashes as received from the south are not uniform in quality. The contents of actual potash in different bags often varies five to ten per cent. To insure a fair sample at least a ton of the stock must be worked over and thoroughly mixed.

WOOD ASHES.

1647. Canada Leached Ashes, bought of Nelson Alvord, Southport by A. H. Burr, Westport, cost 15 cents per bushel.

1592. Hardwood Ashes, from C. W. Barbour, Kensington. Cost \$12.50 per ton.

1633. Wood Ashes from stock purchased by C. B. Meeker, Westport, from Charles Stevens, Napanee, Canada. Cost \$10.50 per ton. Weight per bushel, 45 pounds.

1699. Unleached Wood Ashes, bought of James Hartness, Detroit, Mich., by N. S. Platt, Cheshire. Cost, 21 cents per bushel of 40 pounds, delivered in Cheshire.

ANALYSES.

	1647	1592	1633	1699
Water.....	24.05			15.24
Insoluble in acid.....	25.25*			14.96
Potash.....	.54	7.26	4.17	5.56
Phosphoric acid.....	1.36	1.73	1.39	1.31

* Mostly broken crockery, glass and nails.

Half of sample No. **1647** is worthless material. It contains about half as much potash as leached ashes of ordinary quality. The station however has no guarantee that this sample fairly represents the stock from which it was taken.

The value of ashes is not exclusively or chiefly in the phosphoric acid and potash which they contain. Their action on the soil is largely indirect; as an amendment. The determinations of potash and phosphoric acid serve to show however whether the sample is of usual quality.

Unleached Canada Ashes contain on the average 5.7 per cent. of potash and 1.2 per cent. of phosphoric acid. Ashes made largely from our hard woods are somewhat richer in both phosphoric acid and potash.

COTTON SEED MEAL AND CASTOR POMACE.

1691. Cotton Seed Meal, stock of Olds & Whipple, Hartford.

1734. Castor Pomace, made by Collier White Lead & Oil Co., St. Louis, Mo. Mixture of samples drawn from stock of F. Ellsworth, Hartford, and Olds & Whipple, Hartford.

ANALYSES.

	1691	1734
Nitrogen.....	7.29	5.54
Phosphoric acid.....	1.84	1.86
Potash.....	2.17	1.07
Cost per ton.....	\$25.00	\$20.00
Valuation per ton.....	\$29.21	\$23.45

BONE MANURES.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Sampled and sent by
1727	Bosworth Bros. Ground Bone	Bosworth Bros., Putnam	Manufacturer	Station Agent.
1654	E. Frank Coc's Ground Bone	E. Frank Coc, 16 Burling Slip, New York	S. Banks, Southport	Station Agent.
1733	Peter Cooper's Pure Bone Dust	Peter Cooper's Glue Factory, New York	Apothecaries' Hall, Waterbury, Brewster & Burnett, Norwich	Station Agent.
1656	Jas. Green's Common Bone	Jas. Green, New York	Chas. Jennings & Son, Southport	Station Agent.
1657	Jas. Green's Pure Fine Bone Dust	Jas. Green, New York	Chas. Jennings & Son, Southport	Station Agent.
1655	Lister Bro's Celebrated Ground Bone	Lister Bros., Newark, N. J.	W. G. Staples, Westport	Station Agent.
1739	Peck Bros. Pure Ground Bone	Peck Bros., Northfield	Apothecaries' Hall, Waterbury	Station Agent.
1653	Quinnipiac Bone Meal	Quinnipiac Fertilizer Co., New London	E. A. Godfrey, Westport	Station Agent.
1718	Pure Ground Raw Knuckle Bone "A"	Rogers & Hubbard Co., Middletown	J. P. Barstow, Norwich S. J. Hall, Meriden	Station Agent. Station Agent.
1670	Williams, Clark & Co's Amerieus Brand Pure Bone Meal	Williams, Clark & Co., Hanover Square, New York	Strong & Backus, Colchester Strong & Backus, Colchester Usher & Tinker, Plainville E. M. Jennings, Southport	Station Agent. Station Agent. Station Agent. Station Agent.

BONE MANURES.—ANALYSES AND VALUATIONS.

Station No.	Name or Brand.	Nitro-gen.	Phos. Acid.	Potash.	Finer than				Coarser than $\frac{1}{6}$ inch.	Cost per ton.	Valuation per ton.
					$\frac{1}{80}$ inch.	$\frac{1}{25}$ inch.	$\frac{1}{15}$ inch.	$\frac{1}{6}$ inch.			
1727	Bosworth Bros. Ground Bone	4.30	21.88	----	71	21	6	2	0	\$34.00	\$42.88
1654	E. Frank Coe's Ground Bone	2.95	12.11	2.13	48	18	16	10	8	28.00	24.62
1733	Peter Cooper's Pure Bone Dust	1.61	30.64	----	53	15	20	12	0	32-34	42.22
1656	Jas. Green's Common Bone	1.97	7.78	----	26	15	16	19	24	25.00	12.90
1657	Jas. Green's Pure Fine Bone Dust	1.16	26.45	----	47	22	16	11	4	32.00	35.05
1655	Lister's Celebrated Ground Bone	3.50	14.12	----	35	22	28	15	0	29.00	26.47
1739	Peck Bros' Pure Ground Bone	4.12	20.92	----	21	20	33	22	4	35.00*	33.50
1653	Quinnipiac Bone Meal	4.22	22.93	----	33	24	40	3	0	38.00	39.36
1718	Rogers & Hubbard Co's Ground Bone A	3.96	25.18	----	23	18	33	26	0	37-38†	37.99
1670	Williams, Clark & Co's Americus Brand Pure Bone Meal	4.31	19.40	----	56	23	19	2	0	36-38	38.06

* \$33.00 cash at mill.

† \$36.00 cash at mill.

NITROGENOUS SUPERPHOSPHATES AND GUANOS.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Cost.	Sampled and sent by
1732	Market Bone Fertilizer.	Adams & Thomas, Springfield, Mass.	Moran Bros., Windsor Locks, Ct.	\$38.00	Station Agent.
1714	Victor Phosphate A1.	Apothecaries' Hall, Waterbury, Ct.	Manufacturer.	35.00	Station Agent.
1713	Baker's A.A. Ammoniated Superphosphate.	H. J. Baker & Bro., 215 Pearl St., New York.	Variety Store, Winsted. W. W. Cooper, Suffield. S. J. Hall, Meriden.	35.00 37.50	Station Agent. Station Agent.
1712	Baker's Complete Potato Manure.	H. J. Baker & Bro., 215 Pearl St., New York.	Smith & Son, W. Cornwall. G. H. Alford, Winsted.	35.00 45.00	Station Agent. Station Agent.
1728	Bosworth's Superphosphate of Lime	Bosworth Bros., Putnam.	W. W. Cooper, Suffield.	45.00	Station Agent.
1716	Bowker's Ammoniated Bone Phosphate.	Bowker Fertilizer Co., 43 Chatham St., Boston.	Manufacturer. Jas. Greenfield, New London. Strong & Backus, Colchester.	36.00 36.00	Station Agent. Station Agent.
1678	Stockbridge Vegetable Manure.	Bowker Fertilizer Co., 43 Chatham St., Boston.	Seymour & Bonhite, Ridgefield. J. E. Leoniard, Jewett City.	40.00 45.00	Station Agent. Station Agent.
1677	Bradley's Patent Superphosphate.	Bradley Fertilizer Co., 27 Kilby St., Boston.	Jas. Greenfield, New London. F. Ellsworth, Hartford.	45.00 45.00	Station Agent. Station Agent.
1676	E. F. Coe's High Grade Ammoniated Bone Superphosphate.	E. F. Coe, 16 Burling Slip, New York.	A. C. Sternburg, Hartford. Chas. Jennings & Son, Southport Usher & Tinker, Plainville. D. B. Judd & Co., Bristol. Strong & Backus, Colchester.	38.00 40.00 40.00 38.00	Station Agent. Station Agent. Station Agent. Station Agent.
1740	Common Sense Fertilizer, No. 2.	Common Sense Fertilizer Co., Boston, Mass.	Wm. D. Holman, W. Willington S. Banks, Southport. Arnold Rudd, New London.	38.00 34.00 35.00	Station Agent. Station Agent. Station Agent.
1738	Golden Leaf Fertilizer.	Soluble Pacific Guano Co., Boston, Mass.	Strong & Backus, Colchester. J. B. Carpenter, W. Willington. D. Deers, Danbury.	36.00 36.00 35.00	Station Agent. Station Agent. Station Agent.
1675	Soluble Pacific Guano.	Soluble Pacific Guano Co., Boston, Mass.	Jas. Greenfield, New London. H. A. Stillman, Hartford.	35.00 42.00-44.00	Station Agent. Station Agent.
			Jas. Greenfield, New London. J. B. Carpenter, W. Willington. H. A. Stillman, Hartford.	38.00 36.00 36.00-38.00	Station Agent. Station Agent. Station Agent.

NITROGENOUS SUPERPHOSPHATES AND GUANOS.—Continued.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Cost.	Sampled and sent by
1736	E. R. Kelsey's Fish and Potash.	E. R. Kelsey, Branford.	N. S. Baldwin, Meriden.	21.00—21.50	Station Agent.
1735	Mapes' Complete Manure "A" Brand.	Mapes' Formula and Peruvian Guano Co., 158 Front St., New York.	Mapes' Branch, Hartford. Birdsey & Foster, Meriden.	\$38.00 39.50	Station Agent. Station Agent.
1674	Mapes' Complete Manure for General Use.	Mapes' Formula & Peruvian Guano Co., 158 Front St., New York.	Dean & Horton, Stamford. Mapes' Branch, Hartford.	40.00 43.00	Station Agent. Station Agent.
1717	Mapes' Potato Manure.	Mapes' Formula & Peruvian Guano Co., 158 Front St., New York.	Strong & Backus, Colchester. Dean & Horton, Stamford.	41.00 39.00	Station Agent. Station Agent.
1660	Cecrops or Dragons Tooth Fertilizer.	Newton & Ludlam, New York.	Birdsey & Foster, Meriden.	48.00	Station Agent.
1662	Cereal Fertilizer.	Newton & Ludlam, New York.	Mapes' Branch, Hartford.	47.50	Station Agent.
1664	Cooke's Blood Guano.	Read & Co., 88 Wall St., New York.	S. Banks, Southport. S. Banks, Southport.	46.00 40.00	Station Agent. Station Agent.
1737	Charter Oak Fertilizer.	P. Thomson, Hartford.	Swan's Seed Store, Bridgeport. S. J. Hall, Meriden.	34.00 -----	Station Agent. Station Agent.
1665	Quinnipiac Potato Manure.	Quinnipiac Fertilz. Co., New London.	Strong & Backus, Colchester.	37.00	Station Agent.
1671	Quinnipiac Phosphate.	Quinnipiac Fertilizer Co., New London.	J. R. Cogswell, Putnam. B. B. Warren & Son, Plainville.	30.00 30.00	Station Agent. Station Agent.
1673	Quinnipiac Fish and Potash Crossed Fishes Brand.	Quinnipiac Fertilizer Co., New London.	E. A. Godfrey, Westport. Usher & Tinker, Plainville.	38.00 40.00	Station Agent. Station Agent.
1661	Dissolved Bone Black.	Williams, Clark & Co., Hanover Square, New York.	Olds & Whipple, Hartford. P. & G. M. Williams, N. London.	38.00 38.00	Station Agent. Station Agent.
1679	Americus Brand Ammoniated Superphosphate.	Williams, Clark & Co., Hanover Square, New York.	E. A. Godfrey, Westport. Olds & Whipple, Hartford.	38.00 38.00	Station Agent. Station Agent.
1663	Wilkinson & Co's Patent Ammoniated Superphosphate.	Wilkinson & Co., New York.	Usher & Tinker, Plainville. E. M. Jennings, Southport.	38.00 35.00	Station Agent. Station Agent.
			J. P. Root, Tolland.	38.00	Station Agent.
			E. M. Jennings, Southport.	38.00	Station Agent.
			Strong & Backus, Colchester.	36.00	Station Agent.
			Usher & Tinker, Plainville.	38.00	Station Agent.
			Ferris & Nolan, Stamford.	38.00	Station Agent.

NITROGENOUS SUPERPHOSPHATES AND GUANOS.

Station No.	Name or Brand.	Nitrogen.					Phosphoric Acid.					Potash.		Chlorine.	Cost per ton.	Valuation per ton.			
		Nitrogen as Nitrates.	Nitrogen as Ammonia.	Nitrogen Organic.	Total Nitrogen Found.	Nitrogen Guaranteed.	Soluble in Water.	Reverted.	Insoluble.	Total Phos. Acid Found.	Phos. Acid Guaranteed.	Available.							
												Found.	Guaranteed.						
1732	Adams & Thomas' Market Bone Fertilizer	---	.50	3.03	3.53	3.00	4.29	4.86	.31	9.46	9.00	9.15	8.00	4.65	3.00	3.46	\$38.00	\$30.46	
1714	Victor Phosphate, A1	---	.18	2.06	2.24	1.85	8.32	1.43	1.10	10.85	---	9.75	8.50	2.28	3.50*	.09	35.00	26.27	
1713	Baker's A. A. Ammoniated Superphosphate	---	1.63	.87	2.50	2.47	10.91	.35	.03	11.29	---	11.26	10.00	3.02	2.00	3.85	35-37	29.56	
1712	Baker's Complete Potato Manure	---	3.09	.59	3.59	3.29	5.79	.47	trace	6.26	---	6.26	5.00	10.13	10.00	3.68	45.00	33.01	
1728	Bosworth's Superphosphate of Lime	---	1.17	1.37	2.54	2.00	6.58	4.46	4.53	15.57	---	11.04	11.00	3.02	2.00	2.75	36.00	31.50	
1716	Bowler's Ammoniated Bone Superphosphate	---	.30	1.81	2.11	2.06	9.43	1.97	.82	12.22	10.00	11.40	8.00	1.88	4.00*	4.55	36.00	27.40	
1678	Stockbridge Vegetable Manure	---	1.19	2.06	3.25	3.29	10.32	1.71	.81	12.84	8.00	12.03	---	3.97	5.00	4.26	45.00	34.43	
1677	Bradley's Patent Superphosphate	.13	.44	2.23	2.74	2.27	8.58	1.79	1.62	11.99	---	10.37	9.00	2.07	1.50	1.85	38-40†	28.66	
1676	E. Frank Coe's High Grade Ammoniated Superphosphate	---	.59	1.60	2.19	2.06	8.00	2.07	1.99	12.06	---	10.07	9.00	1.79	2.00*	.12	34-36	26.65	
1740	Common Sense Fertilizer, No 2	.71	.24	1.14	2.09	2.00	none	4.52	.73	5.25	4.00	4.52	---	4.93	3.00	4.67	35.00	18.80	
1738	Golden Leaf Fertilizer	---	2.92	.86	3.78	3.70	6.32	2.13	3.44	11.89	8.00	8.45	---	6.60	7.00	.81	42-44	36.08	
1675	Soluble Pacific Guano	---	.45	1.93	2.38	2.00	7.31	2.01	2.61	11.93	---	9.32	---	2.50	2.00	2.84	36-38	26.65	
1736	Kelsey's Fish and Potash	---	.41	2.93	3.34	2.47	1.12	1.49	.22	2.83	3.00	2.61	---	3.29	3.00	---	21.00	18.44	
1735	Mapes' Complete Manure "A"	---	.38	.51	2.17	3.09	2.47	6.98	5.20	1.98	14.16	---	12.18	10.00	3.31	2.50	4.72	38-40	33.64
1674	Mapes' Complete for General Use	.43	1.17	2.02	3.62	3.29	6.71	3.70	2.36	12.77	10.00	10.41	---	4.82	4.00	3.01	39-43	34.80	
1717	Mapes' Potato Manure	.57	1.72	1.60	3.89	3.70	6.61	3.51	.98	11.10	8.00	10.12	---	7.39	6.00*	.62	46-48	38.27	
1660	Cecrops or Dragon's Tooth Fertilizer	---	.95	2.41	3.36	3.29	6.51	1.01	.96	8.48	---	7.52	7.00	8.32	7.00	8.96	40.00	31.29	
1662	Cereal Fertilizer	---	---	1.18	1.18	1.24	9.96	1.71	.72	12.39	12.00	11.67	10.00	2.06	4.00*	2.79	34.00	24.70	
1664	Cooke's Blood Guano	---	---	2.26	2.26	1.65	6.25	1.79	1.24	9.28	---	8.04	7.00	3.33	---	4.37	37-38	23.94	
1737	Chart Oak Fertilizer	---	.28	.77	2.99	1.65	trace	1.48	.77	2.25	2.25	1.48	---	2.65	2.00	---	30.00	15.77	
1665	Quinnipiac Potato Manure	---	2.08	1.99	4.07	3.25	4.12	4.22	.81	9.15	---	8.34	5.00	6.92	6.00	.60	38.00	35.29	
1671	Quinnipiac Phosphate	---	1.73	1.25	2.98	2.50	7.56	4.81	.65	13.02	---	12.37	8.00	4.48	2.90	1.78	38.00	34.65	
1673	Quinnipiac Fish and Potash Crossed Fishes Brand	---	.55	3.20	3.75	3.25	2.02	3.39	1.46	6.87	5.00	5.41	3.00	6.90	3.00	5.58	38.00	27.98	
1661	Dissolved Bone Black	---	---	---	---	---	15.46	2.88	.17	18.51	---	18.34	15.00	---	---	---	35.00	---	
1679	Americus Brand Ammoniated Superphosphate	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
1663	Wilkinson's Patent Ammoniated Superphosphate	---	.14	2.62	2.76	2.47	9.52	2.05	.81	12.38	11.00	11.57	---	2.94	2.00	.37	36-38	31.35	
		---	---	2.09	2.09	1.65	7.58	1.31	.20	9.02	---	8.89	---	5.14	2.00	7.82	38.00	25.69	

* Sulphate. † Manufacturer states "retail price should not be over \$38.00 in Connecticut."